TOXIDROMES

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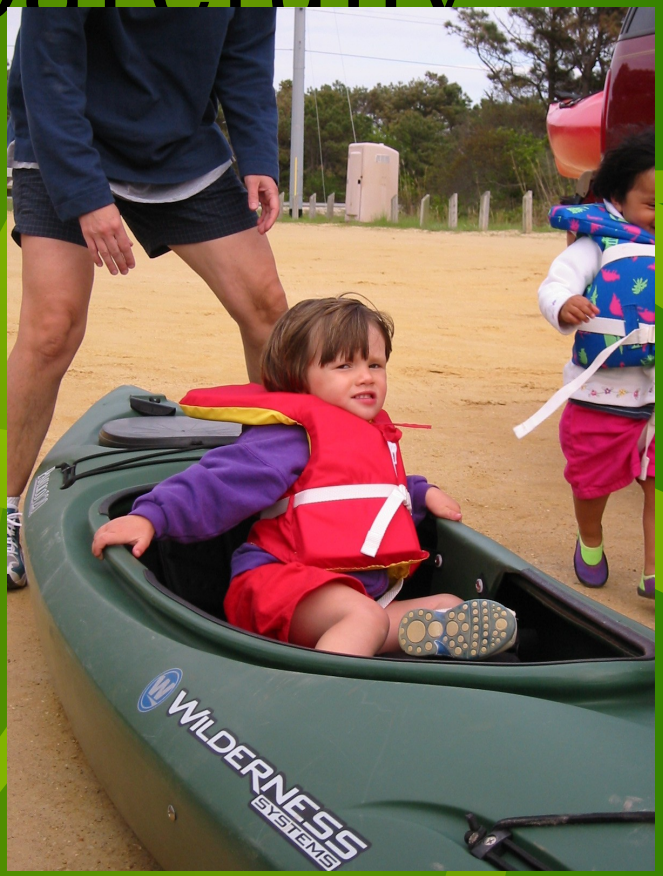
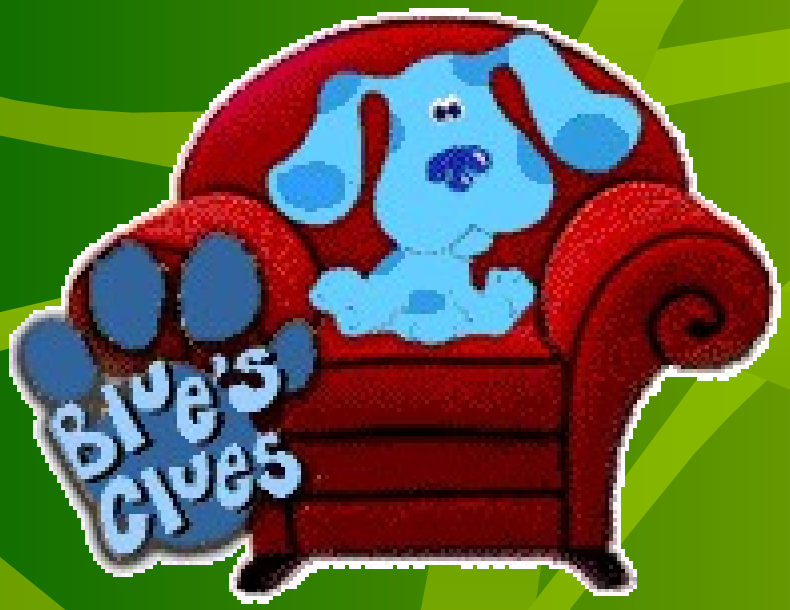
Choose Collaborators Carefully!



Searching for Clues



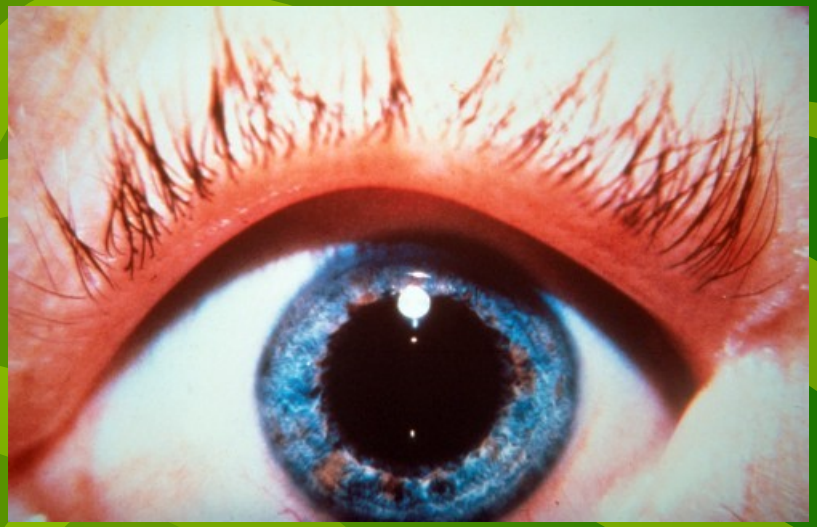
- History
- Physical Exam
- Laboratory Studies
- Treatment

HISTORY

- When to suspect
- Approach to known exposure
- Approach to unknown exposure

PHYSICAL EXAMINATION

- VS
- Eye exam
- Skin
- Neuro



LABORATORY EXAM

- Anion gap, acid-base status, osmolar gap
- BUN/creat, UA
- ECG
- Abd film
- CXR
- Toxicology screen

APPROACH TO TREATMENT

- Early and effective decontamination
- Supportive therapy
- Antidotes
- Enhanced elimination

TOXIC SYNDROMES AND DRUG OVERDOSAGES

- Physiologic stimulants
- Physiologic depressants
- Other drug overdosages

PHYSIOLOGIC STIMULANTS

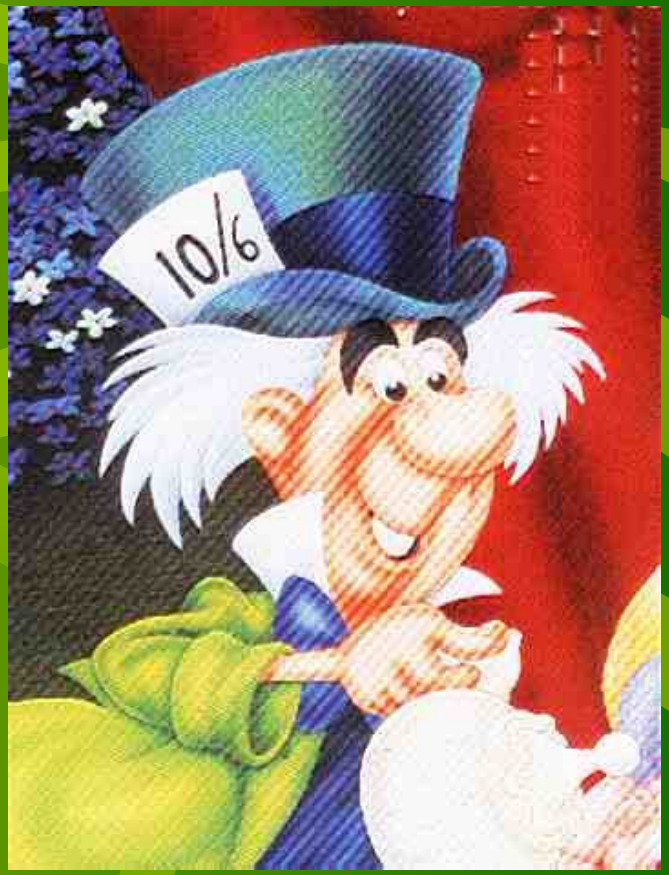
- Anticholinergics
- Sympathomimetics (ex. cocaine)
- Hallucinogens
- Drug withdrawal
- Miscellaneous (thyroid hormones)

ANTICHOLINERGICS

- ANTIHISTAMINES
- ANTIPSYCHOTICS
- BELLADONNA ALKALOIDS
- CYCLIC ANTIDEPRESSANT
- CYCLOBENZAPRINE
- PARKINSON'S DZ DRUGS
- GI/GU ANTISPASMODICS
- MYDRIATRICS
- PLANTS/ MUSHROOMS

ANTICHOLINERGICS: ATROPINE

- CLINICAL PRESENTATION
  - “Hot as a hare, dry as a bone, mad as a hatter”
  - Dryness of mouth
  - flushed, hot, dry skin
  - dilated and nonreactive pupils
  - tachycardia
  - hallucinations, restlessness



ANTICHOLINERGIC: ATROPINE

- TREATMENT
  - Gut decontamination
  - Physostigmine
  - Supportive care

COCAINE

- CLINICAL PRESENTATION
  - tachycardia, HTN arrhythmia
  - can get hypotension and reflex bradycardia
  - CNS stimulation

COCAINE

- TREATMENT
  - CNS sedation
  - Labetolol
  - Treat hyperthermia
  - ?Parlodel or desipramine

Hallucinogens

- Stimulation of serotoninergic system
- Illusions, visual hallucinations, sweating, tachycardia, pupillary dilatation
- Usu done in 12 hours
- No true withdrawal state

Hallucinogens

- Treatment
  - Generally do not require medical treatment
  - Can use benzodiazepine for agitation
  - Reduce stimuli
  - Discontinuation can result in dysphoria from reduced serotonin activity. SSRI can be used for 3-6 months

PHYSIOLOGIC DEPRESSANTS

- Cholinergics
- Narcotics
- Symphatholytics (cyclic antidepressants)
- Sedative-hypnotics
- Miscellaneous (carbon monoxide)

CHOLINERGICS

- BETHANACOL
- CARBAMATE INSECTICIDES
- MYASTHENIA GRAVIS DRUGS
- EDROPHONIUM
- PHYSOSTIGMIN E
- PILOCARPINE
- NICOTINE

CHOLINERGICS: CLINICAL PRESENTATION

- **D**EFECATION
- **U**RINATION
- **M**IOSIS
- **B**RONCHO-CONSTRICTION
- **B**RADYCARDIA
- **E**MESIS
- **L**ACRIMATION
- **S**ALIVATION

CHOLINERGICS

- TREATMENT
  - Gastric decontamination
  - Respiratory support
  - Atropine
  - Pralidoxime
  - Cardiac monitoring
  - Tx seizures with benzodiazipine

OPIATES

- CLINICAL PRESENTATION
  - Pinpoint pupils
  - Respiratory depression
  - Bradycardia
  - Hypotension
  - Hypothermia
  - Pulmonary edema
  - Seizures

OPIATES

- TREATMENT
  - Acute
    - Naloxone
  - Chronic
    - Methadone
    - Catapres
    - Naltrexone

OPIATES

- POSSIBLE COMPLICATIONS
  - Aspiration
  - Pulmonary edema
  - Withdrawal symptoms
  - Need for repeated doses

BENZODIAZIPINES

- CLINICAL PRESENTATION
- Respiratory depression
- Drowsiness
- Coma

BENZODIAZIPINES

- TREATMENT
  - Generally requires no pharmacologic intervention
  - Flumazenil

CYCLIC ANTIDEPRESSANTS

- CLINICAL PRESENTATION
  - Most are combination anticholinergic and sympatholytic
  - Coma
  - Seizures
  - Hypotension
  - Cardiac dysrhythmias

CYCLIC ANTIDEPRESSANTS

- TREATMENT
  - Gastric decontamination
  - Treat cardiac dysrhythmias
  - Treat seizures

OTHER DRUGS

- DISSOCIATIVE DRUGS
- ACETOMINOPHEN
- SALICYLATES
- DIGOXIN
- SEROTONIN SYNDROME
- LITHIUM
- “CLUB DRUGS”

DISSOCIATIVE DRUGS

- Ketamine, Phenycyclidine (PCP), Phenylcyclohexylpyrolidine (PHP)
- Acts on all six neurotransmitter systems
  - Anticholinergic: dry skin, miosis
  - Dopamine/norepinephrine:agitation, delusions
  - Opioid:pain perception alterations
  - Serotonin: perceptual changes
  - GABA receptor inhibition: excitation

DISSOCIATIVE DRUGS

- Treatment
  - Haloperidol
    - Presynaptic dopamine antagonist
    - Shifts the dopamine-acetylcholine activity ratio in the limbic system
    - Therefore can counteract the dopamine stimulation and cholinergic antagonism of the drug

ACETAMINOPHEN

- CLINICAL PRESENTATION
  - No specific symptoms or signs

ACETAMINOPHEN

- TREATMENT
  - Gastric decontamination
  - N-acetylcysteine

SALICYLATES

- CLINICAL PRESENTATION
  - Mixed acid-base disturbances
  - GI: N/V, abdominal pain
  - CNS: tinnitus, lethargy seizures, cerebral edema, irritability
  - Resp: pulmonary edema
  - Coagulation abnormalities

DIGOXIN

- CLINICAL PRESENTATION
  - Nausea/vomiting
  - Mental status changes
  - Cardiovascular symptoms

DIGOXIN

- TREATMENT
  - Gastric decontamination
  - Fab fragments

SEROTONIN SYNDROME

- CLINICAL PRESENTATION
  - Neurobehavioral: mental status changes, agitation, confusion, seizures
  - Autonomic: hyperthermia, diaphoresis, diarrhea, tachycardia, HTN, salivation
  - Neuromuscular: myoclonus, hyperreflexia, tremor, muscle rigidity

SEROTONIN SYNDROME

- TREATMENT
  - Respiratory support
  - Temperature control
  - Sedatives
  - Muscle relaxants

LITHIUM

- Symptoms
  - GI: vomiting, diarrhea
  - Neuro: tremors, confusion, dysarthria, vertigo, choreoathetosis, ataxia, hyperreflexia, seizures, opisthotonis, and coma
  - Labs: decreased anion gap
- Treatment
  - Levels >2.5 meq/L
  - Gastric lavage
  - Urinary alkalinization
    - Not very effective
  - Aminophylline
  - Hemodialysis
    - >3.5 mEq/L (acute)
    - >2.5 w/ chronic ingestion or renal insufficiency

“CLUB DRUGS”

- Rave parties increasing in popularity
- Drugs meant to intensify sensory experience of lights/music, facilitate prolonged dancing

MDMA “Ectasy”

- Structurally resembles amphetamine (stimulant) and mescaline (hallucinogen)
- SX: trismus, bruxism, tachycardia, mydriasis, diaphoresis, hyperthermia, hyponatremia, hepatic failure, CV toxicity (tachycardia, HTN)
- Treatment
  - Mainly supportive
  - Benzodiazepines
  - Calm environment
  - Avoid beta-blockers
    - Can result in unopposed alpha effect
    - If essential consider labetolol

GHB: Date rape drug

"Georgia homeboy, liquid ectasy, or grievous bodily harm"

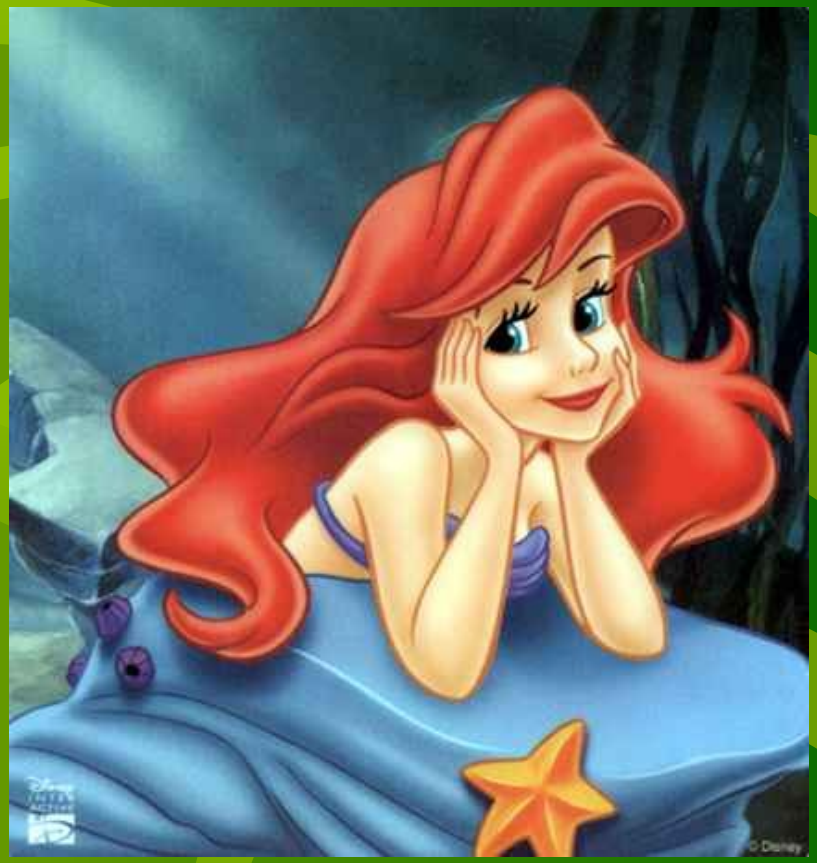
- Developed as anesthetic agent. GABA analog
- Symptoms
  - Bradycardia
  - Hypothermia
  - hypoventilation
  - Somnolence
  - Vomiting
  - Myoclonic jerking
- Treatment
  - Conservative mgmy
  - Intubation
  - Careful exam for sexual assault

Ketamine: “K”, “special K”

- Developed as an anesthetic, structurally resemble PCP
- Symptoms
  - Nystagmus
  - Tachycardai
  - HTN
  - vomiting
- Treatment
  - Benzodiazepines
  - Supportive care
  - IV
  - Can consider urine alkalinization

CLINICAL SCENARIO 1

- A 48 year old unconscious mermaid is brought to the hospital. She is convulsing and has an odor of garlic on her breath. She is incontinent for urine and stool. On exam her VS: T99, HR50, RR24, BP146/88. Skin is diaphoretic. She is drooling. Pupils are constricted. Lungs diffuse wheezing.



CLINICAL SCENARIO 1

- Recognize: Cholinergic poisoning
- Treatment:
  - Gastric decomtamination
  - Respiratory support
  - Cardiac monitoring
  - Atropine followed by pralidoxime
  - Treat seizures with benzodiazepine

CLINICAL SCENARIO 2

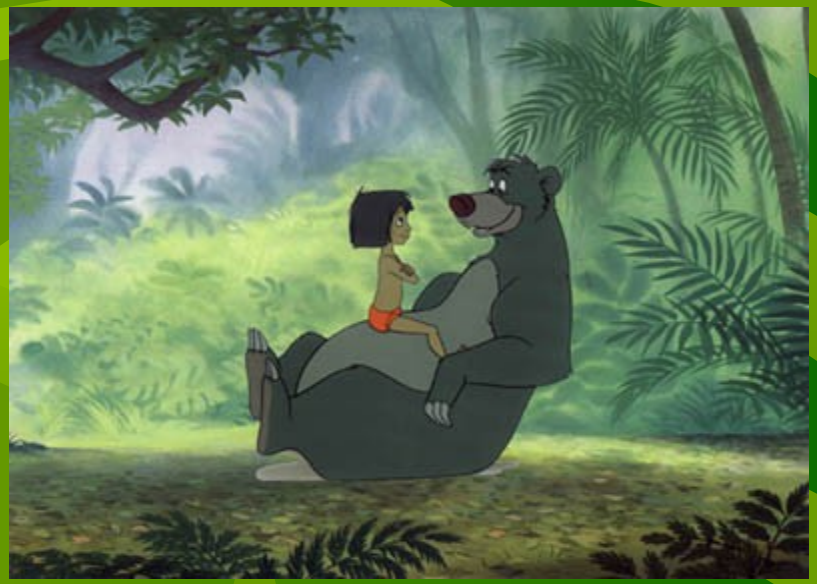
- 17 year old male presents to the hospital with somnolence, slurred speech, and combative behavior. His younger sister said he showed her a handful of small seeds that he was going to take. On exam his VS: T100, HR120, BP100/60, RR22. Skin is warm and dry. Mucous membranes are dry. Pupils are dilated and not reactive.

CLINICAL SCENARIO 2

- Recognize: Anticholinergic poisoning
- Treatment
  - Supportive care
  - Physostigmine
    - Coma
    - Arrythmias
    - Severe HTN
    - Seizures

CLINICAL SCENARIO 3

- 26 y/o bear presents unresponsive. His young friend accompanies him and states he took a handful of pills because he was in pain. On exam his VS: T96, HR40, RR6, BP50/30. Pupils are 3mm.



CLINICAL SCENARIO 3

- Recognize: Opioid poisoning
- Treatment
  - Naloxone

Summary

- Don’t panic!!
- Recognize your clues
- Look for the toxidrome syndrome
- For extra credit: What is this guy on?!